



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 466 820 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

13.10.2004 Bulletin 2004/42

(51) Int Cl.7: **B62J 13/04**

(21) Application number: **04075753.6**

(22) Date of filing: **08.03.2004**

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PL PT RO SE SI SK TR**

Designated Extension States:

AL LT LV MK

(30) Priority: **10.03.2003 NL 1022879**

(71) Applicant: **De Woerd B.V.**

NL-3771 VG Barneveld (NL)

(72) Inventors:

- **van der Veen, Onno Gerard Pieter**
7411 EM Deventer (NL)
- **Jonkman, Pim Jacob Roelof**
3812 XK Amersfoort (NL)
- **Versloot, Eric Jan**
3532 GN Utrecht (NL)

(74) Representative: **Brookhuis, Hendrik Jan Arnold**

Exter Polak & Charlouis B.V.

P.O. Box 3241

2280 GE Rijswijk (NL)

(54) Chain guard assembly for a bicycle

(57) A chain guard assembly for a bicycle, comprising: a chain guard for protecting the bicycle chain (19), front securing means for securing the chain guard to or in the vicinity of the bottom bracket (1) of the bicycle, and rear securing means for securing the chain guard to the chain stay (3) of the bicycle.

The bicycle is of the type in which the bicycle chain crosses the chain stay (3).

The front securing means and the rear securing means comprise a common carrier (24) which can be secured to the chain guard, which carrier has a front part

(24a), which can be secured to or in the vicinity of the bottom bracket (1) of the bicycle, and a rear part (24b), which is designed for the fitting of a securing member (30) which is designed to be secured to the chain stay (3).

The rear securing means are designed in such a manner that these rear securing means create an adjustable angular position of the carrier with respect to the chain stay (3), so that this angular position can be matched to the angle with which the bicycle chain (19) crosses the chain stay (3).

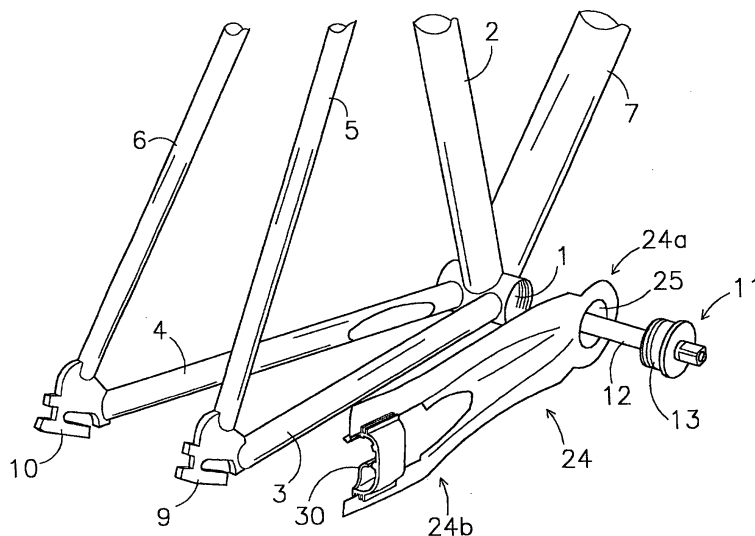


Fig 1

Description

[0001] The invention relates to a chain guard assembly for a bicycle. Chain guard assemblies for bicycles are known from the prior art, with a chain guard for protecting the bicycle chain, front securing means for securing the chain guard to or in the vicinity of the bottom bracket of the bicycle, and with rear securing means for securing the chain guard to the chain stay of the bicycle.

[0002] In a generally known type of bicycle, the frame is designed in such a manner that the bicycle chain crosses the chain stay of the bicycle.

[0003] In the bicycle industry, efficient production of all kinds of designs of bicycles is highly important. The different designs mean that a bicycle manufacturer often requires a considerable number of differently designed chain guard assemblies, even though they appear the same. The difference in design of the chain guard assemblies is then often attributable to a difference in position of the bicycle chain, also known as the chain line, with respect to the chain stay to which the chain guard is secured.

[0004] It is an object of the present invention, in accordance with a first aspect thereof, to provide a chain guard assembly which can easily be adapted to the position of the chain line and chain stay.

[0005] The invention, in accordance with its first aspect, provides a chain guard assembly in accordance with claim 1.

[0006] The design of the rear securing means makes it possible to adjust the position of the carrier with respect to the chain stay within a defined angular range. The adjustment of the desired position may be carried out by the manufacturer of the chain guard assemblies and/or during fitting of the chain guard assembly to the bicycle, if appropriate depending on the design of the rear securing means.

[0007] A second aspect of the invention relates to the way in which a chain guard assembly is fitted to a bicycle. In the bicycle industry, there is a need for rapid and reliable fitting of the chain guard assembly to the frame. The fitting time of the known chain guard assemblies causes problems in this context.

[0008] The second aspect of the invention achieves this object by providing a chain guard assembly in accordance with claim 16.

[0009] In particular, the second aspect of the invention provides a click-fit securing member for securing the chain guard to the chain stay.

[0010] Furthermore, the invention relates to a bicycle provided with a chain guard assembly in accordance with the first and/or second aspect of the invention, and the method(s) for assembling a bicycle using a chain guard assembly in accordance with one or more aspects of the invention as explained above.

[0011] Of course, the various aspects of the invention can also be used in various combinations, as will become apparent, inter alia, from the following description

of a preferred embodiment of the chain guard assembly according to the invention and the assembly of a bicycle having this chain guard assembly.

[0012] In the drawing:

Fig. 1 shows a perspective view of part of a bicycle frame and a carrier and securing member of the chain guard assembly, and also a bottom bracket bearing assembly of the bicycle, in an unfitted state, Fig. 2 shows the components from Figure 1 in a fitted state,

Fig. 3 shows the illustration from Figure 2 after the rear wheel, the chainring and the bicycle chain have been fitted,

Fig. 4 shows the illustration from Figure 3 together with the centre part of the chain guard which is to be fitted,

Fig. 5 shows the illustration from Figure 4 with the centre part fitted and with the top part and bottom part of the chain guard still to be fitted,

Fig. 6 shows a cut-away illustration of the fitted chain guard assembly,

Fig. 7 shows a detailed illustration including the securing member,

Fig. 8 shows another detailed illustration including the securing member,

Figs 9a,b show a variant embodiment of the securing member,

Figs. 10a,b show another variant embodiment of the securing member,

Fig. 11 shows yet another variant embodiment of the securing member,

Fig. 12 shows yet another variant embodiment of the securing member,

Fig. 13 shows yet another variant embodiment of the securing member, and

Fig. 14 shows yet another variant embodiment of the securing member.

[0013] A preferred embodiment of a chain guard assembly according to the invention, which is used to protect the bicycle chain, will be explained with reference to Figures 1-8.

[0014] Figures 1-8 show part of a bicycle frame having a bottom bracket 1, a seat tube 2, chain stays 3, 4, seat stays 5, 6 and down tubes 7 leading to the headset of the bicycle (not illustrated).

[0015] The chain stays 3, 5 and seat stays 4, 6 meet one another at respective hub-securing plates 9, 10.

[0016] A bottom bracket bearing assembly 11 having a spindle 12 and having bearings 13 is fitted in the bottom bracket 1. A crank 14 for a pedal 15, as well as a chainring 16, are also fitted to the spindle 12. A rear wheel 17 having a hub provided with a sprocket 18 is fitted between the chain stays and seat stays. A bicycle chain 19 is arranged around the sprockets 16, 18. Since the chainring 16 lies on the outside of the frame and the sprocket 18 lies on the inside of the chain stays and seat

stays 3, 5, the line of the chain 19 crosses the chain stay 3, as seen from above.

[0017] To protect the chain 19, a chain guard assembly is provided, and this will be explained in more detail below.

[0018] The chain guard assembly comprises a chain guard, which can be assembled from a centre part 20, bottom part 21 and top part 22. Furthermore, there are front securing means for securing the chain guard to or in the vicinity of the bottom bracket 1 of the bicycle, and rear securing means for securing the chain guard to the chain stay 3 of the bicycle.

[0019] These front securing means and rear securing means in this case comprise a common carrier 24, which carrier 24 has a front part 24a, which is provided with an opening 25 at the location of the bottom bracket 1, and a rear part 24b, which is designed for the fitting of a securing member 30, which is designed to be secured to the chain stay 3.

[0020] The chain guard assembly is in this case designed in such a manner that the carrier 24 can be secured, as a separate component, to the frame, and that then the parts of the chain guard are fitted.

[0021] The carrier 24 is designed as a plate element, preferably made from suitable plastic, if appropriate fibre-reinforced plastic or the like.

[0022] The front part 24a of the carrier 24 can be clamped between the edge of the bottom bracket 1 and the bottom bracket bearing assembly 11 which is to be fitted therein.

[0023] The rear part 24b of the carrier 24 does not run parallel to the chain stay 3, but rather is positioned at an angle thereto. Furthermore, the rear part 24b has a bottom limb 26 and a top limb 27, with a slot 28 between them, which is open at the rear end of the carrier 24, for the chain stay 3 to pass through.

[0024] The limbs 26, 27, on the sides which face one another, have parallel edges and thereby form a longitudinal guide for the securing member 30, which engages on the parallel edges of the limbs 26, 27.

[0025] The securing member 30 is slid onto the limbs 26, 27 and is designed as a click-fit securing member, so that a click-fit connection to the chain stay 3 can be produced by pressing the member 30 onto this chain stay 3.

[0026] As can be seen clearly from Figures 7 and 8, the body of the securing member 30 is provided with a plurality of slots 31 located next to one another, in this example with three such slots, in which the limbs 26, 27 can be received.

[0027] The securing of the carrier 24 to the chain stay 3 as described above allows the angular position of the chain guard with respect to the chain stay to be adjusted, so that this angular position can be matched to the angle at which the bicycle chain 19 crosses the chain stay 3.

[0028] This is achieved here firstly by virtue of the fact that the member 30 creates securing to the chain stay 3 at a location which, as seen in the direction of the chain

stay 3, can be adjusted with respect to the chain guard within an adjustment range defined by the limbs 26, 27. Since the limbs 26, 27 are at an angle with respect to the chain stay 3, a longitudinal displacement of the member 30 along the limbs 26, 27 causes a transverse displacement of the rear part of the carrier 24 (and therefore of the chain guard) with respect to the frame. In practice, an adjustment range of a few centimetres, for example 8 centimetres proves sufficient.

[0029] Secondly, an adjustment of the transverse distance between carrier 24 and chain stay 3 can be achieved by means of the choice of slots 31 in which the limbs 26, 27 are positioned. In this respect, the member 30 comprises a plurality of discrete transverse distances, while the longitudinal displacement is continuously adjustable.

[0030] In a variant which is not shown, the carrier 24 is provided with indexing formations for creating discrete locations of the securing member 30 with respect to the carrier 24, so that a plurality of discrete locations are created within the adjustment range. This indexing may, for example, be such that the manufacturer of the chain guard assemblies produces a carrier 24 which is suitable for a plurality of types of bicycles and uses the indexing to indicate the position in which the member 30 is to be fitted for the bicycle in question.

[0031] The securing member 30 is in this case a single-piece plastic member with a body which forms a space for receiving the chain stay 3. The body has a stable hook part 33 which is designed to engage over the top side of the chain stay 3, and an elastic blocking lip 34, which together with the hook part 33 delimits an entry opening 35 for the chain stay 3.

[0032] Elastic deformation of the blocking lip 34 allows the chain stay 3 to be moved into the space, after which the blocking lip springs back elastically into a blocking position, so that the chain stay 3 is locked in place.

[0033] Supporting ribs 36, which bear against the chain stay 3, are formed on the inner circumference of the body, distributed around part of the circumference.

[0034] The securing member 30 can be matched to different designs of chain stays, for example different diameters, by adjustment of the dimensions and/or position of supporting ribs 30, by virtue of associated parts of the injection mould being changed.

[0035] After the carrier 24 has been fitted to the frame, the chain ring 16, the crank 14, the rear wheel 17 and the chain 19 are fitted.

[0036] Then, the centre part 20 is fitted to the carrier 24, for example using click-fit securing members and/or hook securing members (not shown). It is preferable to provide interacting positioning means, so that the centre part 20 adopts precisely the correct position with respect to the carrier.

[0037] Finally, the top part 22 and the bottom part 21 of the chain guard are attached, if appropriate also using click-fit securing members.

[0038] It will be clear that the aspects of the invention which have been described in combination here may also be employed in other combinations or separately. By way of example, the idea of the click-fit securing to the chain stay can also be employed in a conventional chain guard.

[0039] Figures 9a, 9b show a securing member 40 as an alternative to member 30. The member 40 has two hinged parts 40a, 40b which in the closed position form the space 41 for the chain stay. Part 40a is intended to be fitted to the chain guard, and is in this example provided with slots 42 for the limbs 26, 27 of the carrier 24.

[0040] That part of each part 40a, 40b which surrounds the space 42 may be moulded using an exchangeable mould part, so that the position of the space 40 can be adjusted during the injection moulding. In particular, adjustment is effected in the transverse direction, but of course it is also conceivable for an adjustment in the vertical direction or alternatively a combination of such adjustments to be employed.

[0041] Figures 10a, b show securing member 45, limbs 26, 27 of the carrier 24 and chain stay 3. The securing member 45 forms a supporting part 46 for the chain stay 3 and has a flexible tensioning belt 47 for holding the stay 3 against the said supporting part 46. The tensioning belt 47 has hook ribs 48 which can hook into an opening 49 in the limb 26.

[0042] Figure 11 shows a rear wall 50 of a chain guard provided with a supporting part 51 for chain stay 3. A U-shaped bracket part 52 can be fixed, by means of its limbs provided with hook ribs 53, in openings in the rear wall 50 and then presses the chain stay 3 onto the supporting part 51. The supporting part 52 is removable. The provision of supporting parts 51 with different dimensions makes it possible to adjust the transverse distance between the chain guard and the stay 3.

[0043] Figure 12 shows a securing member 55 which is intended for fitting to a chain guard and a chain stay. The member 55 has a supporting part 56, which is fitted to the chain guard. The clamping part 57 and the supporting part 56 are provided with interacting hook means 58 for locking them with respect to one another around the chain stay (not shown). Matching to the diameter of the stay is brought about by a flexible design of supporting ribs 59 which bear against the chain stay.

[0044] Figure 13 shows a securing member 60, stay 3 and rear wall 61 of a chain guard. A base part 62 is fitted to the rear wall 61 and is provided with a flexible tensioning belt 63 and an insertion opening for fixing that part of the belt 63 which is provided with hook ribs 64. To adjust the position of the stay 3 with respect to the rear wall 61 and/or to match this position to the stay 3, an exchangeable supporting part 65 is positioned on the base part 62.

[0045] Figure 14 shows a variant of Figures 10a, b. The securing member 66 has a tensioning belt 67 for pulling the hinged parts 66a, 66b towards one another.

[0046] It will be clear to the person skilled in the art

that the measures and aspects of the invention which are described here can also be applied to the vertical adjustment of the position of the chain guard with respect to the chain stay.

Claims

1. Chain guard assembly for a bicycle, comprising:

- a chain guard for protecting the bicycle chain,
- front securing means for securing the chain guard to or in the vicinity of the bottom bracket of the bicycle,
- rear securing means for securing the chain guard to the chain stay of the bicycle,

the bicycle being of the type in which the bicycle chain crosses the chain stay,

characterized in that the front securing means and the rear securing means comprise a common carrier which can be secured to the chain guard, which carrier has a front part, which can be secured to or in the vicinity of the bottom bracket of the bicycle, and a rear part, which is designed for the fitting of a securing member which is designed to be secured to the chain stay, and **in that**

the rear securing means are designed to secure the carrier to the chain stay and are designed in such a manner that these rear securing means provide an adjustable angular position of the carrier with respect to the chain stay, so that this angular position can be matched to the angle at which the bicycle chain crosses the chain stay and/or for the vertical adjustment of the position of the chain guard with respect to the chain stay.

2. Chain guard assembly according to claim 1, in which the carrier can be secured to the bicycle and the one or more parts of the chain guard can then be secured to the carrier, and in which, for example, the chain guard has a centre part which can be secured over the carrier using interacting coupling means, for example using click-fit and/or hook securing members, as well as a top part and a bottom part.

3. Chain guard assembly according to one or more of the preceding claims, in which the rear securing means create a plurality of discrete angular positions.

4. Chain guard assembly according to one of the preceding claims, in which the rear securing means, as seen in the direction of the chain stay, create securing to the chain stay at a location which is fixed with respect to the carrier.

5. Chain guard assembly according to one of claims 1-3, in which the rear securing means, as seen in the direction of the chain stay, create securing to the chain stay at a location which is adjustable, with-
in an adjustment range, with respect to the carrier, the rear securing means preferably creating a plu-
rality of discrete locations within the adjustment
range or if appropriate creating continuous adjust-
ment of the securing location within the adjustment
range.
6. Chain guard assembly according to one or more of the preceding claims, in which the rear securing means create an adjustable transverse distance between the chain guard and the chain stay, the transverse distance preferably being adjustable such that it can adopt a plurality of discrete transverse distances, or if appropriate the transverse distance being continuously adjustable.
7. Chain guard assembly according to one or more of the preceding claims, in which the rear securing means comprise a longitudinal guide which is provided on the carrier and extends substantially in the direction of the chain stay, and a securing member which engages on the said longitudinal guide and is designed to be secured to the chain stay.
8. Chain guard assembly according to one or more of the preceding claims, in which the rear part of the carrier has a top limb and a bottom limb, between which there is a slot, which is open at the rear end of the carrier, for the chain stay to pass through, those sides of the limbs which face one another, in a preferred embodiment, having parallel edges, thereby forming the longitudinal guide for a securing member which engages on the parallel edges of the limbs.
9. Chain guard assembly according to one of the preceding claims, in which the carrier is provided with an opening at the location of the bottom bracket of the bicycle, and in which preferably the front part of the carrier can be clamped between the edge of the bottom bracket and the bottom bracket bearing assembly which is to be arranged therein.
10. Chain guard assembly according to one or more of the preceding claims, in which the rear securing means are designed in such a manner that they allow the carrier to be fitted to the chain stay without the need for a tool.
11. Chain guard assembly according to one or more of the preceding claims, in which the rear securing means comprise a click-fit securing member which, when a suitable force is exerted, creates a click-fit connection to the chain stay.
12. Chain guard assembly according to claim 11, in which the securing member has a body which forms a space for accommodating the chain stay, which body has a stable hook part which is designed to engage around the chain stay, preferably over the top side thereof, and an elastic blocking lip, which, together with the hook part, delimits an entry opening for the chain stay, so that through elastic deformation of the blocking lip the chain stay can be moved into the space, after which the blocking lip elastically springs back into a blocking position.
13. Chain guard assembly according to one or more of the preceding claims, in which the rear securing means comprise a securing member with a body for receiving the chain stay, which body comprises a base part which can be secured to the carrier or is integral with the carrier, and one or more exchangeable parts, which are accommodated or can be accommodated in the base part and delimit the space for accommodating the chain stay, which exchangeable parts create a position of the space for the chain stay which can be varied in the transverse direction with respect to the base part and therefore the carrier.
14. Chain guard assembly according to claim 13, in which the securing member is a plastic injection-moulded component, and the one or more exchangeable parts are integral with the securing member and are created by changing parts in the injection mould.
15. Chain guard assembly according to claim 13 or 14, in which the exchangeable parts are designed as support ribs which bear against the chain stay and are distributed around the periphery of the space for the chain stay.
16. Chain guard assembly for a bicycle, comprising:
 - a chain guard for protecting the bicycle chain,
 - front securing means for securing the chain guard to or in the vicinity of the bottom bracket of the bicycle,
 - rear securing means for securing the chain guard to the chain stay of the bicycle,

characterized in that the rear securing means are designed in such a manner that they allow the chain guard to be fitted to the chain stay without it being necessary to use a tool.
17. Chain guard assembly according to claim 16, in which the rear securing means comprise a click-fit securing member which, when a suitable force is exerted, create a click-fit connection to the chain stay, the securing member preferably having a body

which forms a space for receiving the chain stay, which body has a stable hook part which is designed to engage around the chain stay, preferably over the top side thereof, and an elastic blocking lip, which, together with the hook part, delimits an entry opening for the chain stay, so that through elastic deformation of the blocking lip the chain stay can be moved into the space, after which the blocking lip elastically springs back into a blocking position.

5

10

18. Chain guard assembly according to claim 16 or 17, in which the front securing means and the rear securing means comprise a common carrier, which carrier has a front part which can be secured to or in the vicinity of the bottom bracket of the bicycle, and a rear part which is designed for fitting a securing member which is designed to be secured to the chain stay, it being possible for the carrier to be secured to the bicycle and for the one or more parts of the chain guard then to be secured to the carrier.

15

20

25

30

35

40

45

50

55

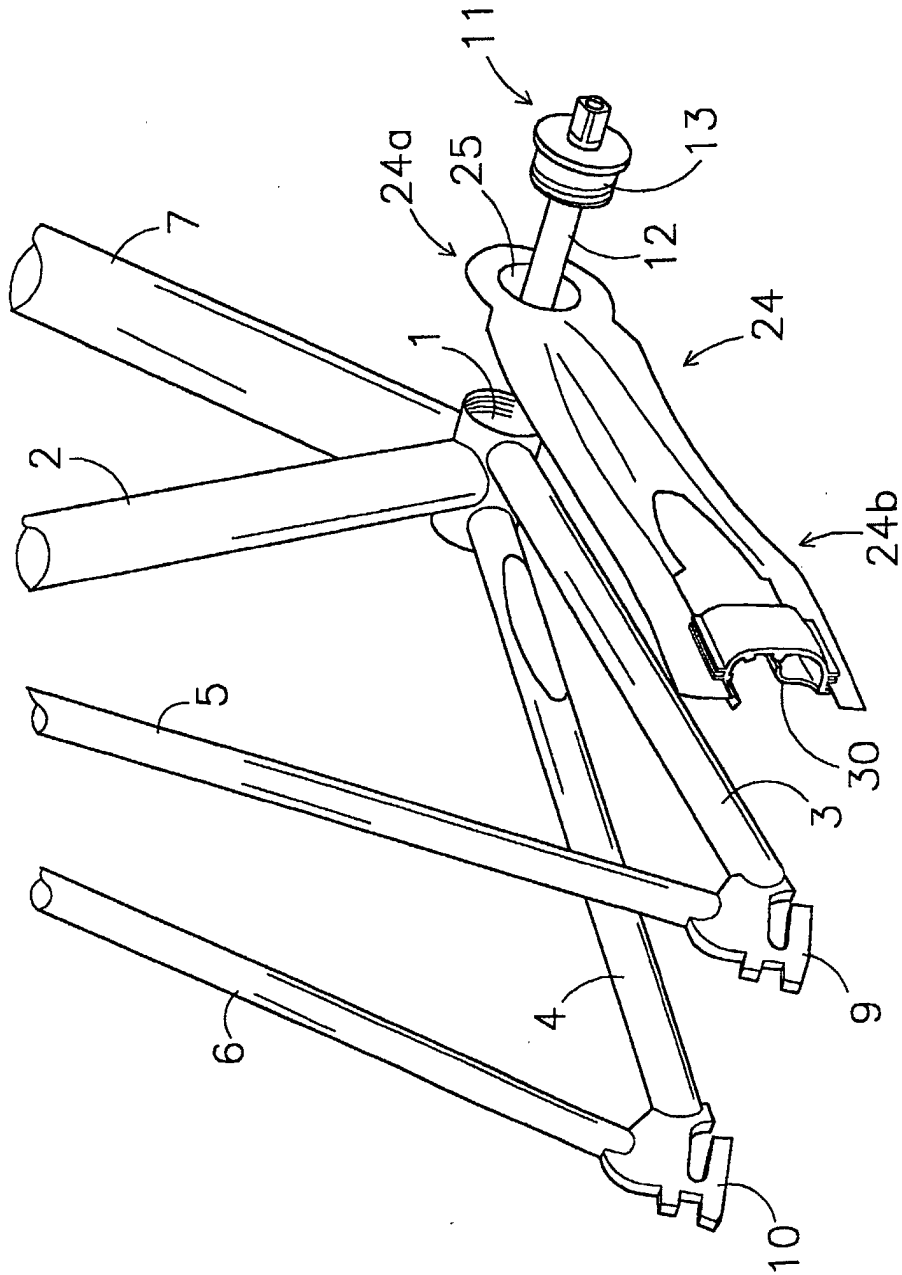


Fig 1

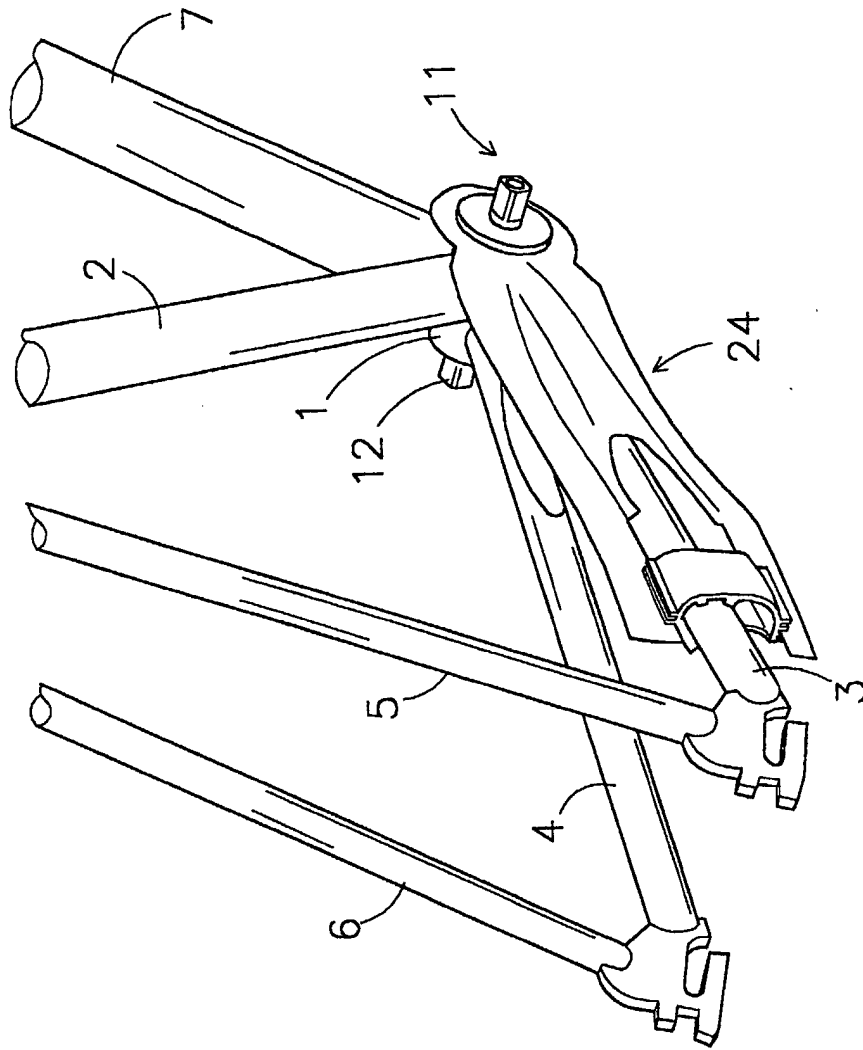


Fig 2

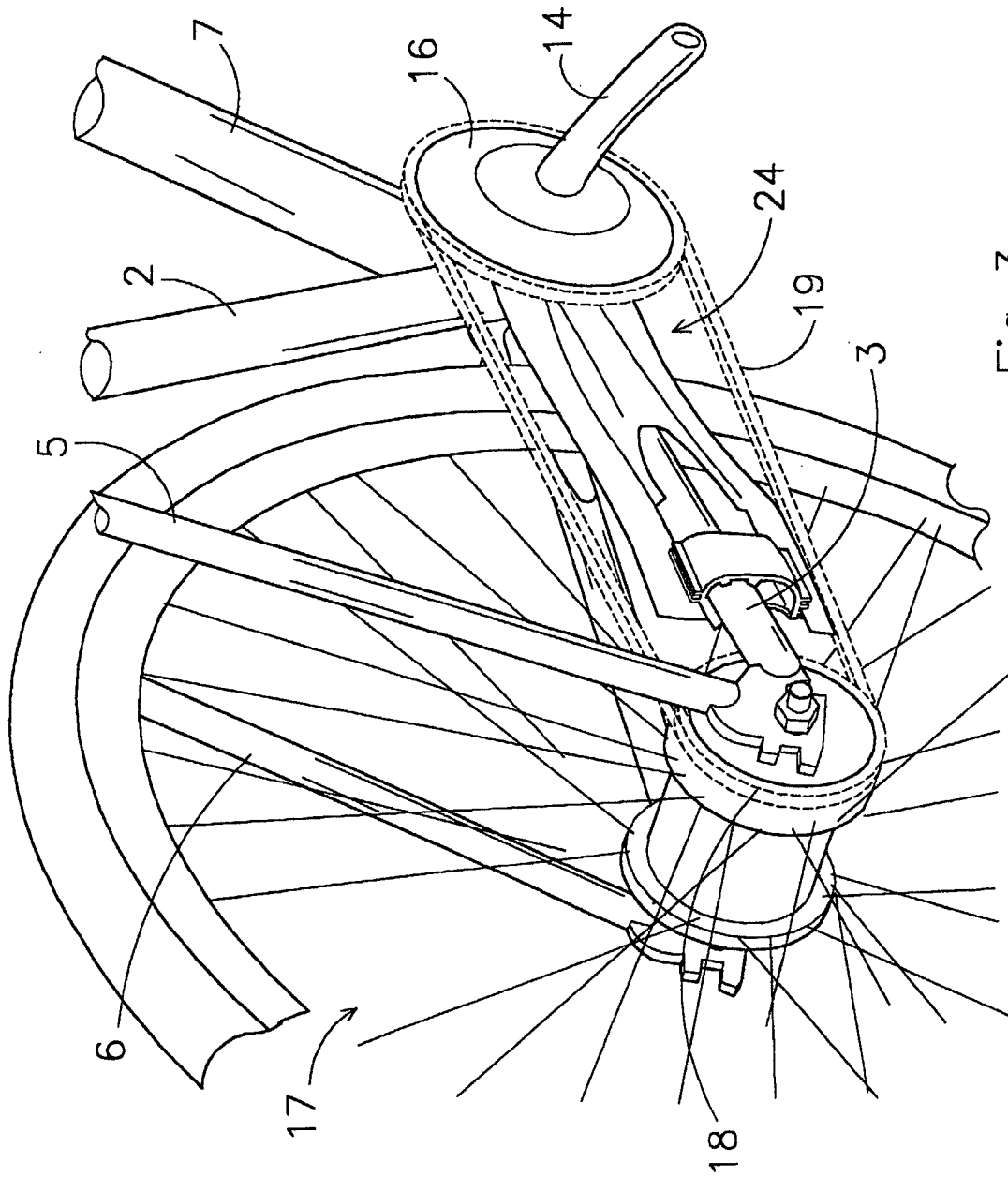


Fig 3

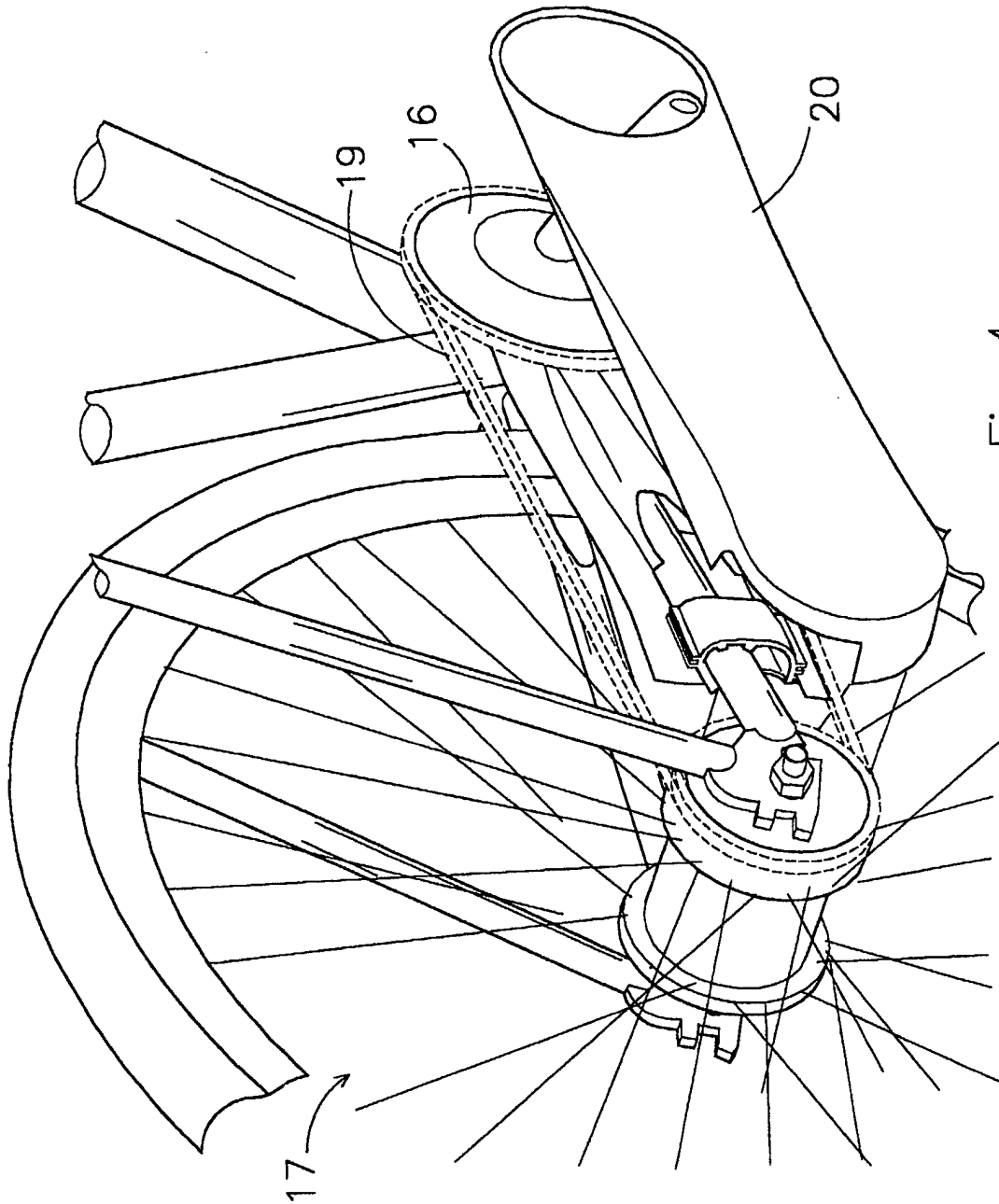


Fig 4

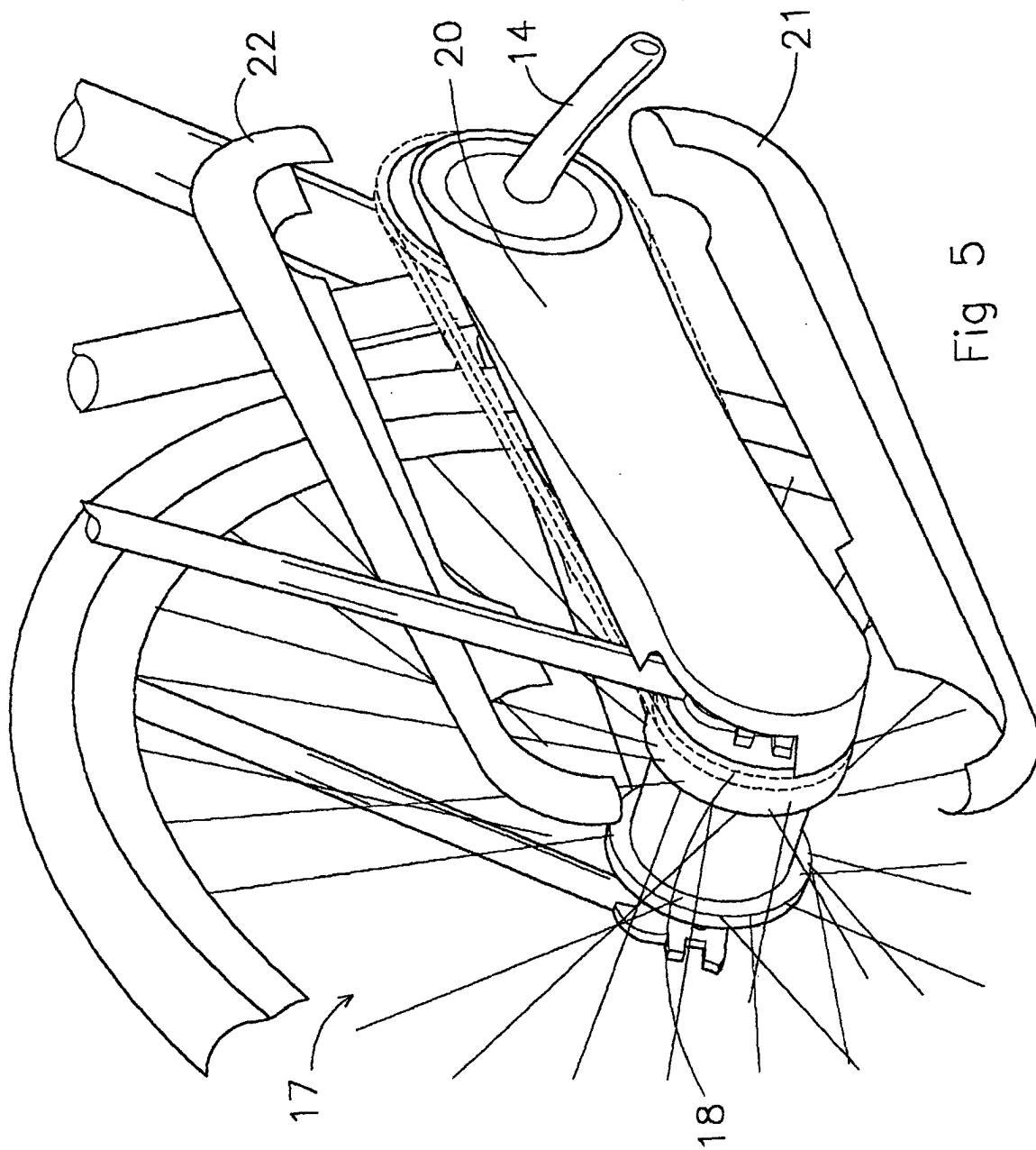


Fig 5

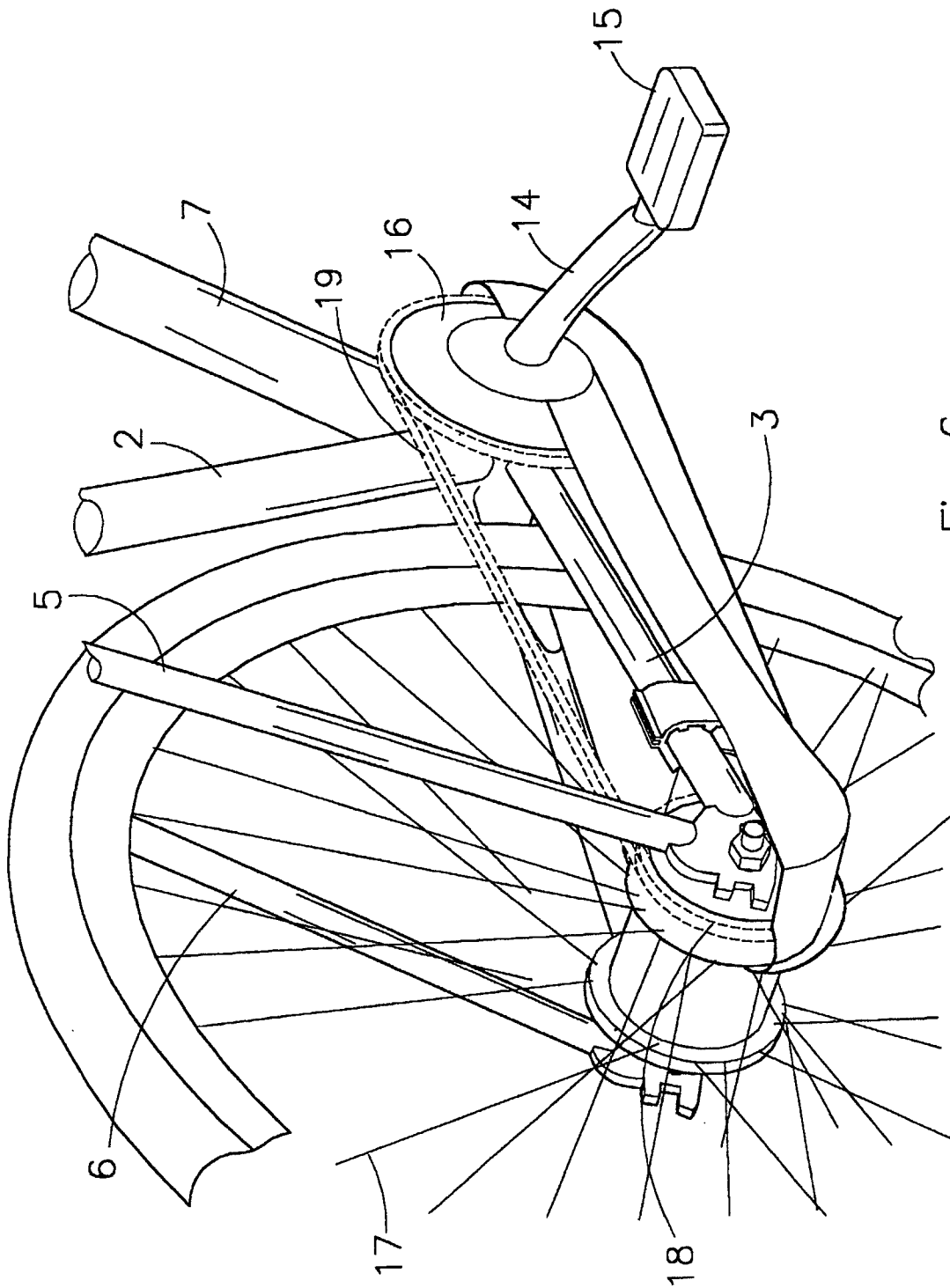


Fig 6

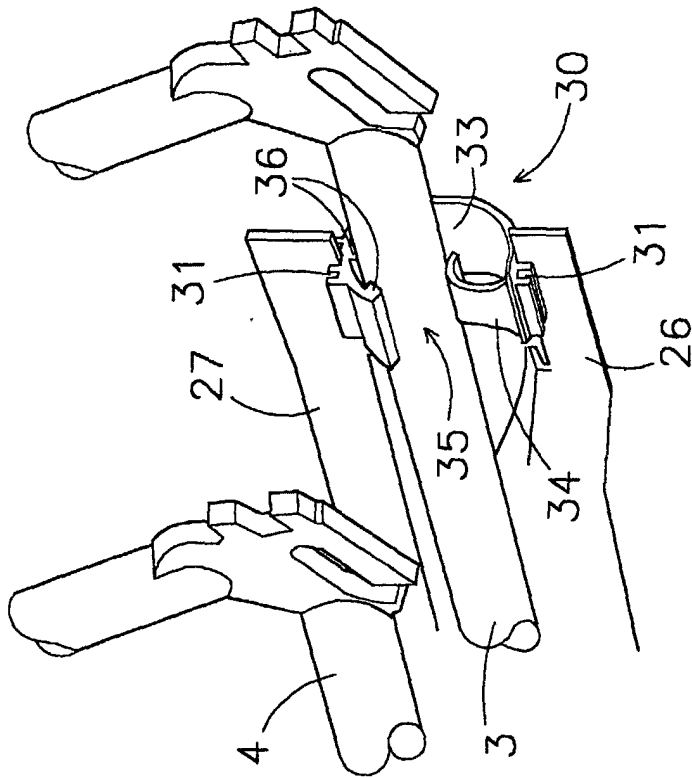


Fig. 8

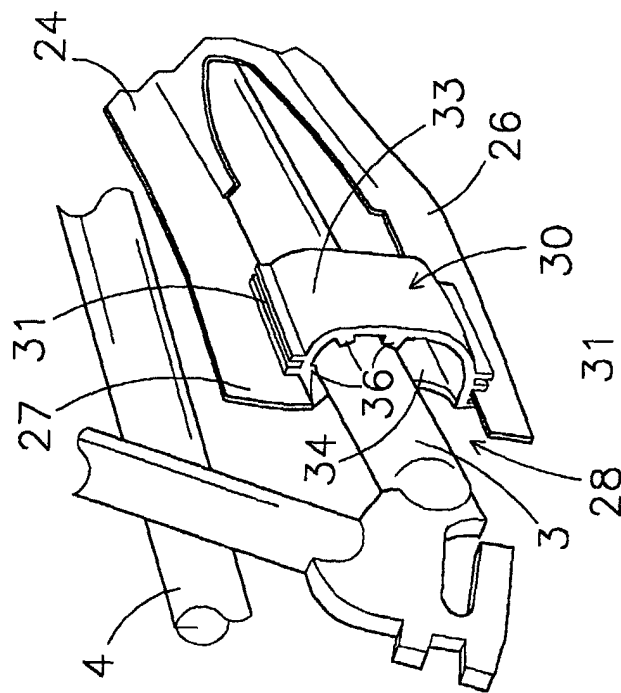


Fig 7

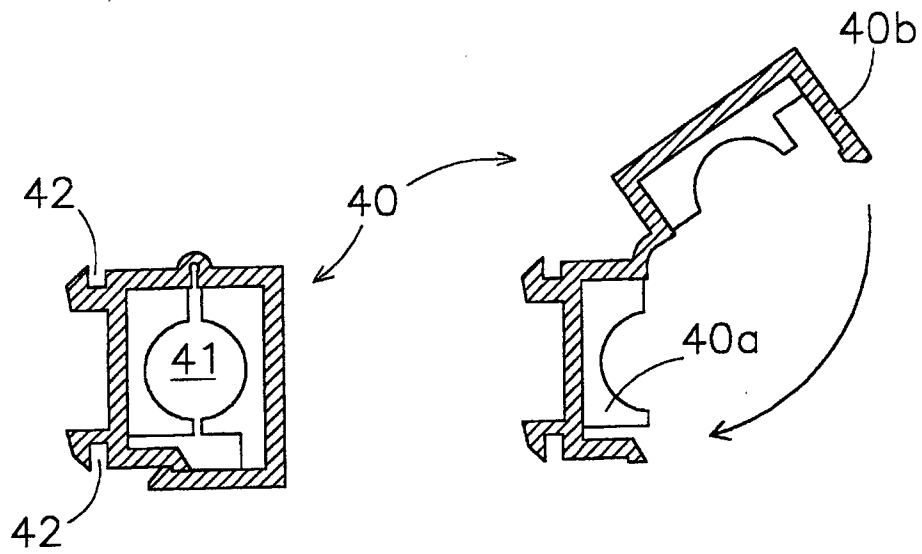


Fig 9b

Fig 9a

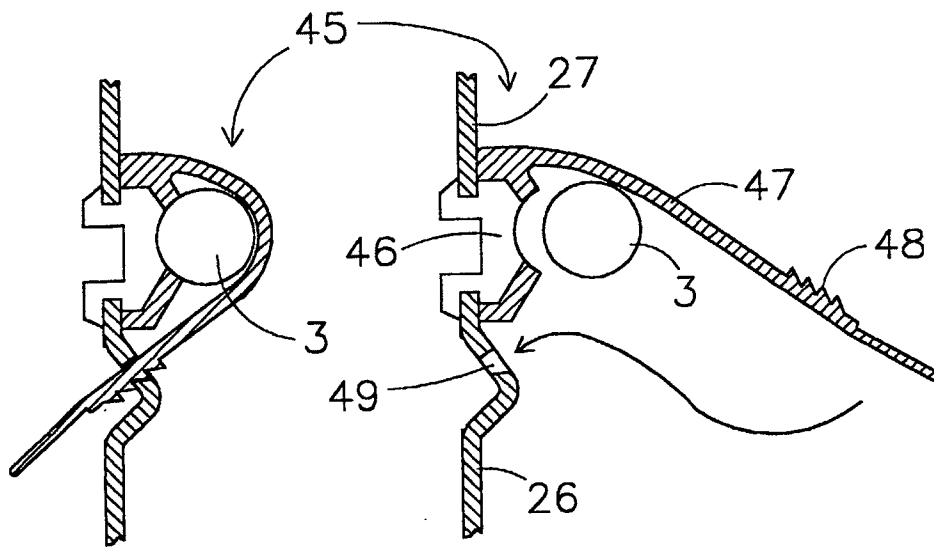


Fig 10b

Fig 10a

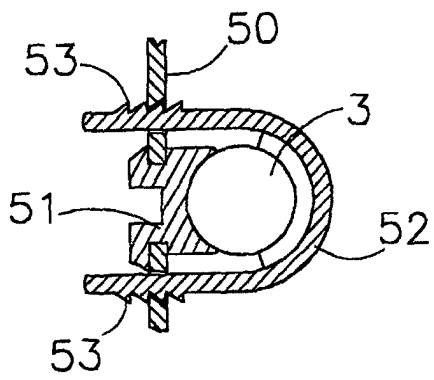


Fig 11

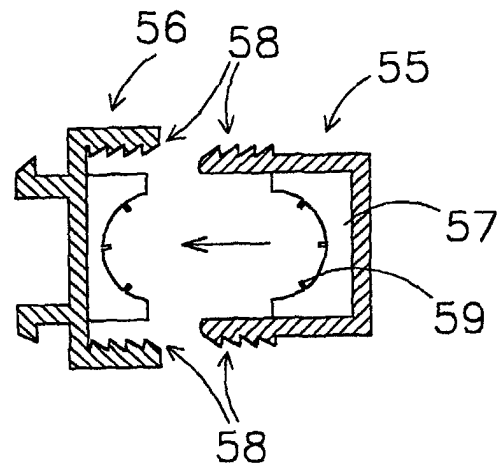


Fig 12

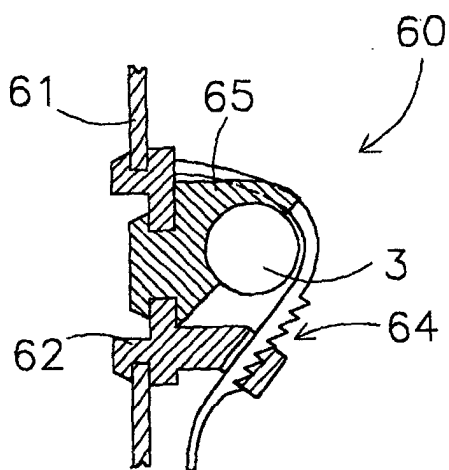


Fig 13

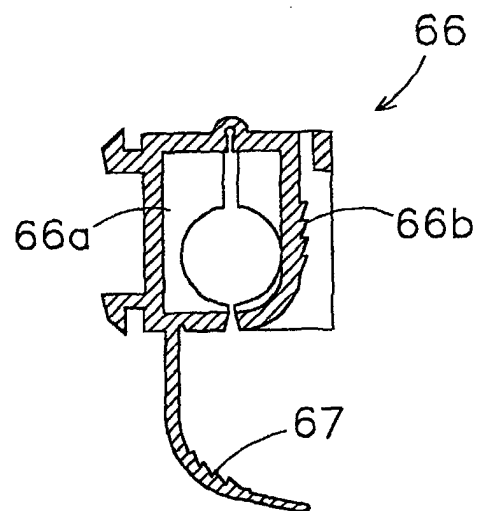


Fig 14